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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/714,910	KIM, DAE-HYUN	
	Examiner	Art Unit	
	James A. Thompson	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/18/03. 3/18/05, 4/22/05*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/18/05,4/22/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings are objected to because the last box in the flow chart of Figure 2 is in Korean rather than English. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 16-18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.** The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claims 16-18 are not enabled by the present specification. Claim 16 requires that "the number of the sub-key frames and the number of the one or

more key frames are constant." Claim 17 requires that "the number of the sub-key frames and the predetermined number of the one or more key frames are variable." Claim 18 requires that "one of the number of the sub-key frames and the predetermined number of the one or more key frames is constant, and the other one of the number of the sub-key frames and the predetermined number of the one or more key frames is variable." The only disclosure with respect to the sub-key frames is located in labelled paragraph 0040 on page 7 of the present specification. The disclosure provides enablement for claim 15, upon which claims 16-18 respectively depend, but does not disclose anything with relation to how, why, or even the mere fact that the number of sub-key frames and key frames are either constant or variable, *as per* the precise recitations of claims 16, 17 and 18. Furthermore, one of ordinary skill in the art would not reasonably infer from the present specification that number of sub-key frames and key frames can be either constant or variable, depending on the particular embodiment desired. Thus, claims 16-18 are not enabled by the present specification.

Claim Rejections 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 3-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhang (US Patent 5,635,982).

Regarding claim 1: Zhang discloses a system (figure 2 of Zhang) to output motion picture data (column 8, lines 58-60 of Zhang), comprising: an interface unit (figure 2(210) of Zhang) connectable with an external device (figure 2(208) of Zhang) to receive frames that are successively input from the external device according to the motion picture data (column 4, lines 54-58 and column 5, lines 16-21 of Zhang – *successive frames of video data are analyzed, and must therefore be received from the input video data*); an image extracting unit (figure 2(212(portion)) of Zhang) to extract at least one key frame from the frames input through the interface unit, the key frame representing the motion picture data (figure 3A1 (310); figure 3A3(322); column 5, lines 30-33 and lines 62-65 of Zhang – *"extraction" occurs through recording of transition (and thus key) frames*); and a controller (figure 2(212(portion)) of Zhang) to control the image extracting unit to extract the at least one key frame to represent the motion picture data upon determining that the motion picture data is received through the interface unit (figure 3(302) and

column 5, lines 16-21 of Zhang – *Detection commences after initialization and loading in current frame. Initialization must also include receiving a certain number of frames prior to "current frame" since previous frames are used in detection. Control of detection commences with first received frame ("first shot" in figure 3(302)) of video.*). While the system of claim 1 is recited as a "printer", Zhang anticipates each and every element of claim 1 and thus anticipates claim 1. Referring to the system as a "printer" is simply a matter of nomenclature in claim 1 since there is no recited printing function. Figure 2(212) of Zhang is a collection of Data Processing Modules (column 4, lines 49-50 of Zhang). The image extracting unit and controller are the respective Data Processing Modules which perform the corresponding functions.

Regarding claim 3: Zhang discloses that the image extracting unit compares a current frame (frame i) that is input through the interface unit with a reference frame (frame i-s) (column 5, lines 17-19 of Zhang), calculates a comparison result (column 5, lines 18-21 of Zhang), compares the comparison result with a predetermined threshold value (column 5, lines 21-24 and lines 34-38 of Zhang), and extracts the current frame as the key frame that represents the motion picture data when the comparison result is greater than the predetermined threshold value (column 5, lines 32-38 and lines 62-65 of Zhang).

Regarding claim 4: Zhang discloses that the reference frame is one of a preceding frame of the current frame and a preceding key frame that is extracted previously (column 5, lines 16-21 of Zhang).

Claim Rejections 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 2, 8-14 and 22-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US Patent 5,635,982) in view of Sugiyama (US Patent 5,633,723).

Regarding claim 2: Zhang does not disclose expressly a print engine unit to print data; an image processor to convert key frame data corresponding to the key frame extracted by the image extracting unit into image data that can be printed in the print engine unit; and that the system is specifically a printer. Since there is a print engine in the system recited in claim 2, said system must now necessarily be a printer.

Sugiyama discloses a printer (figure 1 of Sugiyama) for printing still frames of video data (column 3, lines 11-16 and lines 57-61 of Sugiyama); a print engine unit (figure 1(32-33) of Sugiyama) to print data (column 5, line 63 to column 6, line 5 of Sugiyama); and an image processor (figure 1(31) of Sugiyama) to convert key frame data corresponding to the key frame extracted by the image extracting unit into image data that can be printed in the print engine unit (column 5, line 65 to column 6, line 5 of Sugiyama).

Zhang in view of Sugiyama are combinable because they are from the same field of endeavor, namely processing, frame extraction, and outputting of digital video data. At the time of the invention, it would have been obvious to one of ordinary skill in the art to include an ability to print hardcopies of the extracted frames, as taught by Sugiyama, wherein said extracted frames are the key frames taught by Zhang. The motivation for doing so would have been to obtain a hardcopy output of particularly desired frames of video data (column 1, lines 23-45 of Sugiyama). Therefore, it would have been obvious to combine Sugiyama with Zhang to obtain the invention as specified in claim 2.

Regarding claim 8: Zhang discloses a system (figure 2 of Zhang) comprising: an interface unit (figure 2(210) of Zhang) connectable to an external device (figure 2(208) of Zhang) to receive motion picture data having frames from the external device (column 4, lines 54-58 and column 5, lines 16-21 of Zhang – *successive frames of video data are analyzed, and must therefore be received from the input video data*); and an image extracting unit (figure 2(212(portion)) of Zhang) to extract one or more key frames from the frames (figure 3A1(310); figure 3A3(322); column 5, lines 30-33 and lines 62-65 of Zhang – *"extraction" occurs through recording of transition (and thus key) frames*) according to a difference between the frames (column 5, lines 16-24 of Zhang), the one or more key frames representing the frames of the motion picture data (column 3, lines 1-7 of Zhang). Figure 2(212) of Zhang is a collection of Data Processing Modules (column 4, lines 49-50 of Zhang). The image extracting unit is the respective Data Processing Module which performs the corresponding functions.

Zhang does not disclose expressly that said system is specifically a printer; and that data corresponding to the one or more key frames are printed.

Sugiyama discloses a printer (figure 1 of Sugiyama) for printing still frames of video data (column 3, lines 11-16 and lines 57-61 of Sugiyama); and that data corresponding to one or more selected frames are printed (column 5, line 65 to column 6, line 5 of Sugiyama).

Zhang in view of Sugiyama are combinable because they are from the same field of endeavor, namely processing, frame extraction, and outputting of digital video data. At the time of the invention, it would have been obvious to one of ordinary skill in the art to include an ability to print hardcopies of the

extracted frames, as taught by Sugiyama, wherein said extracted frames are the key frames taught by Zhang. The motivation for doing so would have been to obtain a hardcopy output of particularly desired frames of video data (column 1, lines 23-45 of Sugiyama). Therefore, it would have been obvious to combine Sugiyama with Zhang to obtain the invention as specified in claim 8.

Further regarding claim 9: Sugiyama discloses a printer engine unit (figure 1(32-33) of Sugiyama) to print the data on a printing paper (column 5, line 63 to column 6, line 5 of Sugiyama).

Regarding claim 10: Zhang discloses an input unit (figure 2(212(portion)) of Zhang) through which a signal corresponding to the number of the one or more key frames is inputted to the image extracting unit (column 5, lines 30-33 of Zhang), wherein the image extracting unit extracts the one or more key frames according to the signal (figure 3A1(310); figure 3A3(322); column 5, lines 30-33 and lines 62-65 of Zhang – *"extraction" occurs through recording of transition (and thus key) frames*). Figure 2(212) of Zhang is a collection of Data Processing Modules (column 4, lines 49-50 of Zhang). The input unit is the respective Data Processing Module which performs the corresponding functions.

Regarding claim 11: Zhang does not disclose expressly that the image extracting unit extracts a predetermined number of the one or more key frames from the frames, and the predetermined number is equal to or less than the number of the frames.

Sugiyama discloses extracting a predetermined number of the one or more captured frames from the frames, and the predetermined number is equal to or less than the number of the frames (column 3, line 65 to column 4, line 8 of Sugiyama – *number of frames is predetermined since the mosaic is selected and set before frames are captured for printing*).

Zhang in view of Sugiyama are combinable because they are from the same field of endeavor, namely processing, frame extraction, and outputting of digital video data. At the time of the invention, it would have been obvious to one of ordinary skill in the art to extract only a predetermined number of frames from the available frames, as taught by Sugiyama. In the context of the system of Zhang, the extracted frames would thus be the key frames. The motivation for doing so would have been to allow user conditionable image quality and number of prints, which affects the overall printed output results (column 3, lines 57-61 of Sugiyama). Therefore, it would have been obvious to combine Sugiyama with Zhang to obtain the invention as specified in claim 11.

Further regarding claim 12: Sugiyama discloses that the predetermined number of the one or more selected frames (key frames *as per* the combination of Zhang in view of Sugiyama) and the number of the frames are constant (column 3, line 65 to column 4, line 3 of Sugiyama – *number of selected frames*

set and captured frames are written into the appropriate memory for printing the mosaic; number of available frames not altered by capturing and storing).

Further regarding claim 13: Sugiyama discloses that the predetermined number of the one or more selected frames (key frames *as per* the combination of Zhang in view of Sugiyama) and the number of the frames are variable (column 3, line 65 to column 4, line 3 of Sugiyama). "Predetermined" implicitly requires that the number of key frames remain constant after the determination that occurs before the frame capturing. However, the number of selected (key) frames is variable in that the number of selected (key) frames can be changed in the initial determination before frame capturing.

Further regarding claim 14: Sugiyama discloses that the predetermined number is set before the motion picture data is inputted to the interface unit (column 4, lines 45-51 of Sugiyama).

Further regarding claim 22: Sugiyama discloses a display unit (figure 1(19-20) of Sugiyama) displaying an image corresponding to respectively ones of the one or more selected ("key" in Zhang) frames (column 3, lines 29-35 of Sugiyama).

Regarding claim 23: Zhang discloses a memory unit (figure 2(214) of Zhang) storing the one or more key frames (column 4, lines 51-52 of Zhang).

Regarding claim 24: Zhang discloses a controller (figure 2(212(portion)) of Zhang) controlling the image extracting unit to extract the one or more one key frames from the frames (figure 3(302) and column 5, lines 16-21 of Zhang – *Detection commences after initialization and loading in current frame. Initialization must also include receiving a certain number of frames prior to "current frame" since previous frames are used in detection. Control of detection commences with first received frame ("first shot" in figure 3(302)) of video.*) according to a difference representing one of a first change between pixels of the frames (figure 3A1(306) and column 5, lines 16-24 of Zhang), as second change between predetermined regions of the frames (column 3, lines 49-67 of Zhang), and a third change between the frames (column 5, lines 58-65 of Zhang).

Regarding claim 25: Zhang discloses that each of the frames includes frame information representing at least one of a brightness (intensity) and a motion vector (frame difference) (column 3, lines 18-35 of Zhang), and the first, second and third changes are a change between the frame information of the frames (column 5, lines 16-21 of Zhang).

Regarding claim 26: Zhang discloses a controller (figure 2(212(portion)) of Zhang) controlling the image extracting unit to extract the one or more key frames from the frames (figure 3(302) and column 5, lines 16-21 of Zhang – *Detection commences after initialization and loading in current frame. Initialization must also include receiving a certain number of frames prior to "current frame" since*

previous frames are used in detection. Control of detection commences with first received frame ("first shot" in figure 3(302)) of video.) according to the difference representing a change between brightness histograms corresponding to the respective frames (figure 3C(354) and column 6, lines 9-19 of Zhang).

Regarding claim 27: Zhang discloses a controller (figure 2(212(portion)) of Zhang) controlling the image extracting unit to extract the one or more key frames from the frames (figure 3(302) and column 5, lines 16-21 of Zhang – *Detection commences after initialization and loading in current frame. Initialization must also include receiving a certain number of frames prior to "current frame" since previous frames are used in detection. Control of detection commences with first received frame ("first shot" in figure 3(302)) of video.*) according to the difference representing a change between frame header information (header denoting a new frame, or frame number in header, which gives frame count number) of the frames (column 5, lines 24-34 of Zhang).

Regarding claim 28: Zhang discloses a controller (figure 2(212(portion)) of Zhang) controlling the image extracting unit to extract the one or more key frames from the frames of the moving picture data (figure 3(302) and column 5, lines 16-21 of Zhang – *Detection commences after initialization and loading in current frame. Initialization must also include receiving a certain number of frames prior to "current frame" since previous frames are used in detection. Control of detection commences with first received frame ("first shot" in figure 3(302)) of video.*) according to the difference representing a change from a first image extracting module to a second image extracting module wherein the first and second image extracting modules are used to extract to at least one key frame from the frames of the moving picture data (figure 3A1(306[$D_i > T_b$],314[$D_i > \alpha T_b$]); and column 5, lines 16-24 and lines 34-38 of Zhang – difference between first and second image extracting modules is α-1 since first image extracting module calculates if $D_i > T_b$ to determine key frame and, if no key frame, second image extracting module calculates $D_i > \alpha T_b$ to determine key frame, wherein α is a user tunable parameter greater than one).

Regarding claim 29: Zhang discloses a method used with a system (figure 2 of Zhang), the method comprising: receiving motion picture data having frames from an external device (figure 2(208) of Zhang) connectable to the system (column 4, lines 54-58 and column 5, lines 16-21 of Zhang – *successive frames of video data are analyzed, and must therefore be received from the input video data*); and extracting one or more key frames from the frames of the moving picture data (figure 3A1(310); figure 3A3(322); column 5, lines 30-33 and lines 62-65 of Zhang – *"extraction" occurs through recording of transition (and thus key) frames*) according to a difference between the frames so that data corresponding to the one or more key frames is output (column 5, lines 16-34 of Zhang).

Zhang does not disclose expressly that said output device is specifically a printer; and that said one or more key frames are specifically printed.

Sugiyama discloses printing selected (key) frames on a printer (column 4, lines 35-42 of Sugiyama).

Zhang in view of Sugiyama are combinable because they are from the same field of endeavor, namely processing, frame extraction, and outputting of digital video data. At the time of the invention, it would have been obvious to one of ordinary skill in the art to include an ability to print hardcopies of the extracted frames, as taught by Sugiyama, wherein said extracted frames are the key frames taught by Zhang. The motivation for doing so would have been to obtain a hardcopy output of particularly desired frames of video data (column 1, lines 23-45 of Sugiyama). Therefore, it would have been obvious to combine Sugiyama with Zhang to obtain the invention as specified in claim 29.

9. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US Patent 5,635,982) in view of Sugiyama (US Patent 5,633,723) and Ganesan (US Patent 5,519,640).

Regarding claim 5: Zhang discloses a control method, comprising: receiving data to be output from an external device (figure 2(208) of Zhang) through the interface unit (figure 2(210) and column 4, lines 54-58 and column 5, lines 16-21 of Zhang – *successive frames of video data are analyzed, and must therefore be received from the input video data)*; extracting a key frame from frames that are successively input according to the motion picture data upon input of the motion picture data, the key frame that represents the motion picture data (figure 3A1(310); figure 3A3(322); column 5, lines 30-33 and lines 62-65 of Zhang – *"extraction" occurs through recording of transition (and thus key) frames*); and outputting data related to recorded key frames (column 8, lines 58-60 of Zhang).

Zhang does not disclose expressly that said control method is used with a printer outputting motion picture data, the printer connected with an external device through an interface unit to print out the motion picture data input from the external device; determining whether the data received through the interface unit is the motion picture data and performing said extraction upon said determination; converting key frame data corresponding to the extracted key frame into image data; and printing out the converted image data on a printing paper.

Sugiyama discloses a printer (figure 1 of Sugiyama) outputting motion picture data (column 3, lines 11-16 and lines 57-61 of Sugiyama), the printer connected with an external device (figure 1(32-33) of Sugiyama) through an interface unit to print out the motion picture data input from the external device (column 5, line 63 to column 6, line 5 of Sugiyama); converting frame data corresponding to the extracted

frame into image data (column 3, lines 11-25 of Sugiyama); and printing out frames of video image data on a printing paper (column 4, lines 35-42 of Sugiyama).

Zhang in view of Sugiyama are combinable because they are from the same field of endeavor, namely processing, frame extraction, and outputting of digital video data. At the time of the invention, it would have been obvious to one of ordinary skill in the art to include an ability to print hardcopies of the extracted frames, as taught by Sugiyama, wherein the extracted frames are the key frames taught by Zhang. The motivation for doing so would have been to obtain a hardcopy output of particularly desired frames of video data (column 1, lines 23-45 of Sugiyama). Therefore, it would have been obvious to combine Sugiyama with Zhang.

Zhang in view of Sugiyama does not disclose expressly determining whether the data received through the interface unit is the motion picture data and performing said extraction upon said determination.

Ganesan discloses determining whether data received through an interface unit is motion picture data (figure 1(31-34) and column 5, lines 56-65 of Ganesan).

Zhang in view of Sugiyama is combinable with Ganesan because they are from the same field of endeavor, namely processing and output of digital multi-media frame data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to determine if the digital input data is, in fact, video data and not some other kind of multi-media data, as taught by Ganesan. The suggestion for doing so would have been that there are many different potential input data types, each with their own particular format, and it would therefore be senseless to attempt to process multi-media data that is incompatible with the video processing systems taught by the combination of Zhang in view of Sugiyama. Therefore, it would have been obvious to combine Ganesan with Zhang in view of Sugiyama to obtain the invention as specified in claim 5.

Regarding claim 6: Zhang discloses comparing a current frame of the motion picture data (frame i) that is input through the interface unit with a reference frame (frame i-s) to calculate a comparison result (column 5, lines 17-21 of Zhang); and comparing the comparison result with a predetermined threshold value (column 5, lines 21-24 and lines 34-38 of Zhang) to extract the current frame as the key frame that represents the motion picture data with the comparison result is greater than a predetermined threshold value (column 5, lines 32-38 and lines 62-65 of Zhang).

Regarding claim 7: Zhang discloses that the reference frame is one of a preceding frame of the current frame and a preceding key frame that is extracted previously (column 5, lines 16-21 of Zhang).

10. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US Patent 5,635,982) in view of Sugiyama (US Patent 5,633,723) and Toklu (US Patent 6,549,643).

Regarding claim 15: Zhang in view of Sugiyama does not disclose expressly that the image extracting unit re-extracts a number of sub-key frames from the predetermined number of the one or more key frames to be printed.

Toklu discloses re-extracting a number of sub-key frames from the predetermined number of the one or more key frames to be output (figure 2A(203-209) and column of Toklu – *limited number of key frames are extracted from the total set of key frames [and are thus "sub-key frames"] based on visual similarities of key frames, and then output*).

Zhang in view of Sugiyama is combinable with Toklu because they are from the same field of endeavor, namely processing, frame extraction, and outputting of digital video data. At the time of the invention, it would have been obvious to one of ordinary skill in the art to limit the number of key frames printed by the system of Zhang in view of Sugiyama by outputting a set of re-extracted key frames ("sub-key frames") that are limited based on criteria such as visual similarity, as taught by Toklu. The suggestion for doing so would have been that, in Sugiyama, the mosaic printing has a set number of pictures that can be printed out, such as 4, 9 and 16 for a 2x2, 3x3, and 4x4 mosaic, respectively. The number of key frames of an input video does not generally correspond to one of those exact numbers, so some form of limiting of the number of key frames printed would allow for each section of the mosaic print to be utilized while avoiding a certain level of visual redundancy. Therefore, it would have been obvious to combine Ganesan with Zhang in view of Sugiyama to obtain the invention as specified in claim 15.

Further regarding claim 16: Toklu discloses that the number of sub-key frames and the number of key frames is constant (figure 2A(207,209,210); and column 7, lines 34-37 and lines 56-65 of Toklu – *one key frame for each video segment (and thus constant); key frames eliminated based on visual similarities, so number of resultant re-extracted sub-key frames is constant*).

Further regarding claim 17: Toklu discloses that the number of the sub-key frames and the predetermined number of the one or more key frames are variable (figure 2A(202); figures 2A-2C; column 6, lines 45-48; column 6, line 61 to column 7, line 4; and column 7, line 66 to column 8, line 3 of Toklu – *number of key frames captured and number of key frames eliminated based on visual similarity (and thus the number of sub-key frames remaining) are variable based on which operating level is selected since each operating level has different criteria for key frames and key frame elimination*).

Further regarding claim 18: Sugiyama discloses that the number of frames to be output ("sub-key frames" *as per* the teachings of Toklu) is constant (column 3, line 65 to column 4, line 3 of Sugiyama – *number of selected frames set and captured frames are written into the appropriate memory for printing the mosaic; number of available frames not altered by capturing and storing*).

Toklu discloses that the number of the one or more key frames is variable (figure 2A(202); figures 2A-2C; column 6, lines 45-48; column 6, line 61 to column 7, line 4; and column 7, line 66 to column 8, line 3 of Toklu – *number of key frames captured is variable based on which operating level is selected since each operating level has different criteria for key frame selection*). Thus, by the combination of Zhang in view of Sugiyama and Toklu, one of the number of the sub-key frames and the predetermined number of the one or more key frames is constant (*sub-key frames* as per *the teachings of Sugiyama*), and the other one of the number of the sub-key frames and the predetermined number of the one or more key frames is variable (*key frames* as per *the teachings of Toklu*).

11. Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US Patent 5,635,982) in view of Sugiyama (US Patent 5,633,723) and Prakash (US Patent 6,888,894 B2)

Regarding claim 19: Zhang in view of Sugiyama does not disclose expressly a signal demodulating unit decompressing the motion picture data when the motion picture data is a compressed format, and transmitting the de-compressed motion picture data to the image extracting unit in a frame unit to form the frames.

Prakash discloses a signal demodulating unit (figure 1A(200) of Prakash) decompressing the motion picture data when the motion picture data is a compressed format (column 5, lines 40-44 of Prakash), and transmitting the de-compressed motion picture data to the image extracting unit in a frame unit to form the frames (column 6, lines 22-34 of Prakash).

Zhang in view of Sugiyama is combinable with Prakash because they are from the same field of endeavor, namely processing and output of digital multi-media frame data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to provide the capability to decompress compressed input digital video data. The suggestion for doing so would have been that compressed formats, such as MPEG, are commonplace in the digital video arts. Thus, having a unit that can decompress such data is abundantly useful in digital video data systems. Therefore, it would have been obvious to combine Prakash with Zhang in view of Sugiyama to obtain the invention as specified in claim 19.

Regarding claim 20: Zhang does not disclose expressly a processor to convert the data corresponding to the one or more key frames into image data; and a print engine unit printing the image data.

Sugiyama discloses a processor (figure 1(31) of Sugiyama) to convert the data corresponding to the one or more key frames into image data (column 5, line 65 to column 6, line 5 of Sugiyama); and a print engine unit (figure 1(32-33) of Sugiyama) printing the image data (column 5, line 63 to column 6, line 5 of Sugiyama).

Zhang in view of Sugiyama are combinable because they are from the same field of endeavor, namely processing, frame extraction, and outputting of digital video data. At the time of the invention, it would have been obvious to one of ordinary skill in the art to include an ability to print hardcopies of the extracted frames, as taught by Sugiyama, wherein said extracted frames are the key frames taught by Zhang. The motivation for doing so would have been to obtain a hardcopy output of particularly desired frames of video data (column 1, lines 23-45 of Sugiyama). Therefore, it would have been obvious to combine Sugiyama with Zhang to obtain the invention as specified in claim 20.

Further regarding claim 21: Prakash discloses that the data is an RGB color signal, and the image data is a YMCK color signal (column 2, lines 24-30 of Prakash).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
    a. David Aaron Steele, US Patent 5,884,056, April 2003.
    b. Hori et al., EP 1 024 444 A2, August 2000.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

David Moore

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21 May 2007